EXAMPLE AIR QUALITY ANALYSIS CHECKLIST[a]

1. Source location map(s) showing location with respect to:

   - **!** Urban areas[b]
   - **!** PSD Class I areas
   - **!** Nonattainment areas[b]
   - **!** Topographic features (terrain, lakes, river valleys, etc.)[b]
   - **!** Other major existing sources[b]
   - **!** Other major sources subject to PSD requirements
   - **!** NWS meteorological observations (surface and upper air)
   - **!** On-site/local meteorological observations (surface and upper air)
   - **!** State/local/on-site air quality monitoring locations[b]
   - **!** Plant layout on a topographic map covering a 1km radius of the source with information sufficient to determine GEP stack heights

2. Information on urban/rural characteristics:

   - **!** Land use within 3km of source classified according to Auer (1978): Correlation of land use and cover with meteorological anomalies. *J. Appl. Meteor.*, **17**: 636-643.
   - **!** Population
     - -> total
     - -> density
   - **!** Based on current guidance determination of whether the area should be addressed using urban or rural modeling methodology

---

[a]*Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised*, October 1992 (EPA-450/R-92-019), should be used as a screening tool to determine whether modeling analyses are required. Screening procedures should be refined by the user to be site/problem specific.

[b]Within 50km or distance to which source has a significant impact, whichever is less.

3. Emission inventory and operating/design parameters for major sources within region of significant impact of proposed site (same as required for applicant)

- **!** Actual and allowable annual emission rates (g/s) and operating rates[c]

- **!** Maximum design load short-term emission rate (g/s)[c]

- **!** Associated emissions/stack characteristics as a function of load for maximum, average, and nominal operating conditions if stack height is less than GEP or located in complex terrain. Screening analyses as footnoted above or detailed analyses, if necessary, must be employed to determine the constraining load condition (e.g., 50%, 75%, or 100% load) to be relied upon in the short-term modeling analysis.

  - location (UTM's)
  - height of stack (m) and grade level above MSL
  - stack exit diameter (m)
  - exit velocity (m/s)
  - exit temperature (°K)

- **!** Area source emissions (rates, size of area, height of area source)[c]

- **!** Location and dimensions of buildings (plant layout drawing)

  - to determine GEP stack height
  - to determine potential building downwash considerations for stack heights less than GEP

- **!** Associated parameters

  - boiler size (megawatts, pounds/hr. steam, fuel consumption, etc.)
  - boiler parameters (% excess air, boiler type, type of firing, etc.)
  - operating conditions (pollutant content in fuel, hours of operation, capacity factor, % load for winter, summer, etc.)
  - pollutant control equipment parameters (design efficiency, operation record, e.g., can it be bypassed?, etc.)

- **!** Anticipated growth changes

---

[c]Particulate emissions should be specified as a function of particulate diameter and density ranges.

4. Air quality monitoring data:

- **!** Summary of existing observations for latest five years (including any additional quality assured measured data which can be obtained from any state or local agency or company)[d]

- **!** Comparison with standards

- **!** Discussion of background due to uninventoried sources and contributions from outside the inventoried area and description of the method used for determination of background (should be consistent with the *Guideline*)

5. Meteorological data:

- **!** Five consecutive years of the most recent representative sequential hourly National Weather Service (NWS) data, or one or more years of hourly sequential on-site data

- **!** Discussion of meteorological conditions observed (as applied or modified for the site-specific area, i.e., identify possible variations due to difference between the monitoring site and the specific site of the source)

- **!** Discussion of topographic/land use influences

6. Air quality modeling analyses:

- **!** Model each individual year for which data are available with a recommended model or model demonstrated to be acceptable on a case-by-case basis

  - urban dispersion coefficients for urban areas
  - rural dispersion coefficients for rural areas

- **!** Evaluate downwash if stack height is less than GEP

- **!** Define worst case meteorology

- **!** Determine background and document method

  - long-term
  - short-term

---

[d]See footnote b of this checklist.

- **!** Provide topographic map(s) of receptor network with respect to location of all sources

- **!** Follow current guidance on selection of receptor sites for refined analyses

- **!** Include receptor terrain heights (if applicable) used in analyses

- **!** Compare model estimates with measurements considering the upper ends of the frequency distribution

- **!** Determine extent of significant impact; provide maps

- **!** Define areas of maximum and highest, second-highest impacts due to applicant source (refer to format suggested in Air Quality Summary Tables)

    -> long-term
    -> short-term

7. Comparison with acceptable air quality levels:

- **!** NAAQS

- **!** PSD increments

- **!** Emission offset impacts if nonattainment

8. Documentation and guidelines for modeling methodology:

- **!** Follow guidance documents

    -> Appendix W to 40 CFR Part 51

    -> *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised* (EPA-450/R-92-019), 1992

    -> *Guideline for Determination of Good Engineering Practice Stack Height* (Technical Support Document for the Stack Height Regulations) (EPA-450/4-80-023R), 1985

    -> *Ambient Monitoring Guidelines for PSD* (EPA-450/4-87-007), 1987

    -> Requirements for Preparation, Adoption and Submittal of Implementation Plans: Approval and Promulgation of Implementation Plans, 40 CFR Parts 40 and 51 (Prevention of Significant Deterioration), as amended

Air Quality Summary: For New Source Alone

Pollutant: _____[1] _____[2] _____[2]

	Highest	Highest 2nd High	Highest	Highest 2nd High	Annual
Concentration Due to Modeled Source ($\mu g/m^3$)					
Background Concentration ($\mu g/m^3$)					
Total Concentration ($\mu g/m^3$)					
Receptor Distance (km) (or UTM Easting)					
Receptor Direction (°) (or UTM Northing)					
Receptor Elevation (m)					
Wind Speed (m/s)					
Wind Direction (°)					
Mixing Depth (m)					
Temperature (°K)					
Stability					
Day/Month/Year of Occurrence					

Surface Air Data From _____ Surface Station Elevation (m) _____

Anemometer Height Above Local Ground Level (m) _____

Upper Air Data From _____

Period of Record Analyzed _____

Model Used _____

Recommended Model _____

[1]Use separate sheet for each pollutant (SO_2, PM-10, CO, NO_x, HC, Pb, Hg, Asbestos, etc.)

[2]List all appropriate averaging periods (l-hr, 3-hr, 8-hr, 24-hr, 30-day, 90-day, etc.) for which an air quality standard exists.

Air Quality Summary: For All New Sources

Pollutant: _____[1] _____[2] _____[2]

	Highest	Highest 2nd High	Highest	Highest 2nd High	Annual
Concentration Due to Modeled Source ($\mu g/m^3$)					
Background Concentration ($\mu g/m^3$)					
Total Concentration ($\mu g/m^3$)					
Receptor Distance (km) (or UTM Easting)					
Receptor Direction (°) (or UTM Northing)					
Receptor Elevation (m)					
Wind Speed (m/s)					
Wind Direction (°)					
Mixing Depth (m)					
Temperature (°K)					
Stability					
Day/Month/Year of Occurrence					

Surface Air Data From _____ Surface Station Elevation (m) _____

Anemometer Height Above Local Ground Level (m) _____

Upper Air Data From _____

Period of Record Analyzed _____

Model Used _____

Recommended Model _____

[1]Use separate sheet for each pollutant (SO_2, PM-10, CO, NO_x, HC, Pb, Hg, Asbestos, etc.)

[2]List all appropriate averaging periods (l-hr, 3-hr, 8-hr, 24-hr, 30-day, 90-day, etc.) for which an air quality standard exists

Air Quality Summary: For All Sources

Pollutant: _____[1] _____[2] _____[2]

	Highest	Highest 2nd High	Highest	Highest 2nd High	Annual
Concentration Due to Modeled Source ($\mu g/m^3$)					
Background Concentration ($\mu g/m^3$)					
Total Concentration ($\mu g/m^3$)					
Receptor Distance (km) (or UTM Easting)					
Receptor Direction (°) (or UTM Northing)					
Receptor Elevation (m)					
Wind Speed (m/s)					
Wind Direction (°)					
Mixing Depth (m)					
Temperature (°K)					
Stability					
Day/Month/Year of Occurrence					

Surface Air Data From _____ Surface Station Elevation (m) _____

Anemometer Height Above Local Ground Level (m) _____

Upper Air Data From _____

Period of Record Analyzed _____

Model Used _____

Recommended Model _____

[1]Use separate sheet for each pollutant (SO_2, PM-10, CO, NO_x, HC, Pb, Hg, Asbestos, etc.)

[2]List all appropriate averaging periods (l-hr, 3-hr, 8-hr, 24-hr, 30-day, 90-day, etc.) for which an air quality standard exists.

STACK PARAMETERS FOR ANNUAL MODELING

Stack No.	Serving	Emission Rate for each Pollutant (g/s)	Stack Exit Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (°K)	Physical Stack Height (m)	GEP Stack Ht.(m)	Stack Base Elevation (m)	Building Dimensions (m) Height	Width	Length

STACK PARAMETERS FOR SHORT-TERM MODELING[1]

Stack No.	Serving	Emission Rate for each Pollutant (g/s)	Stack Exit Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (°K)	Physical Stack Height (m)	GEP Stack Ht.(m)	Stack Base Elevation (m)	Building Dimensions (m) Height	Width	Length

[1]Separate tables for 50%, 75%, 100% of full operating condition (and any other operating conditions as determined by screening or detailed modeling analyses to represent constraining operating conditions) should be provided.